OIPE
FEB 05 2007
PATENT & TRADEMARK OFFICE

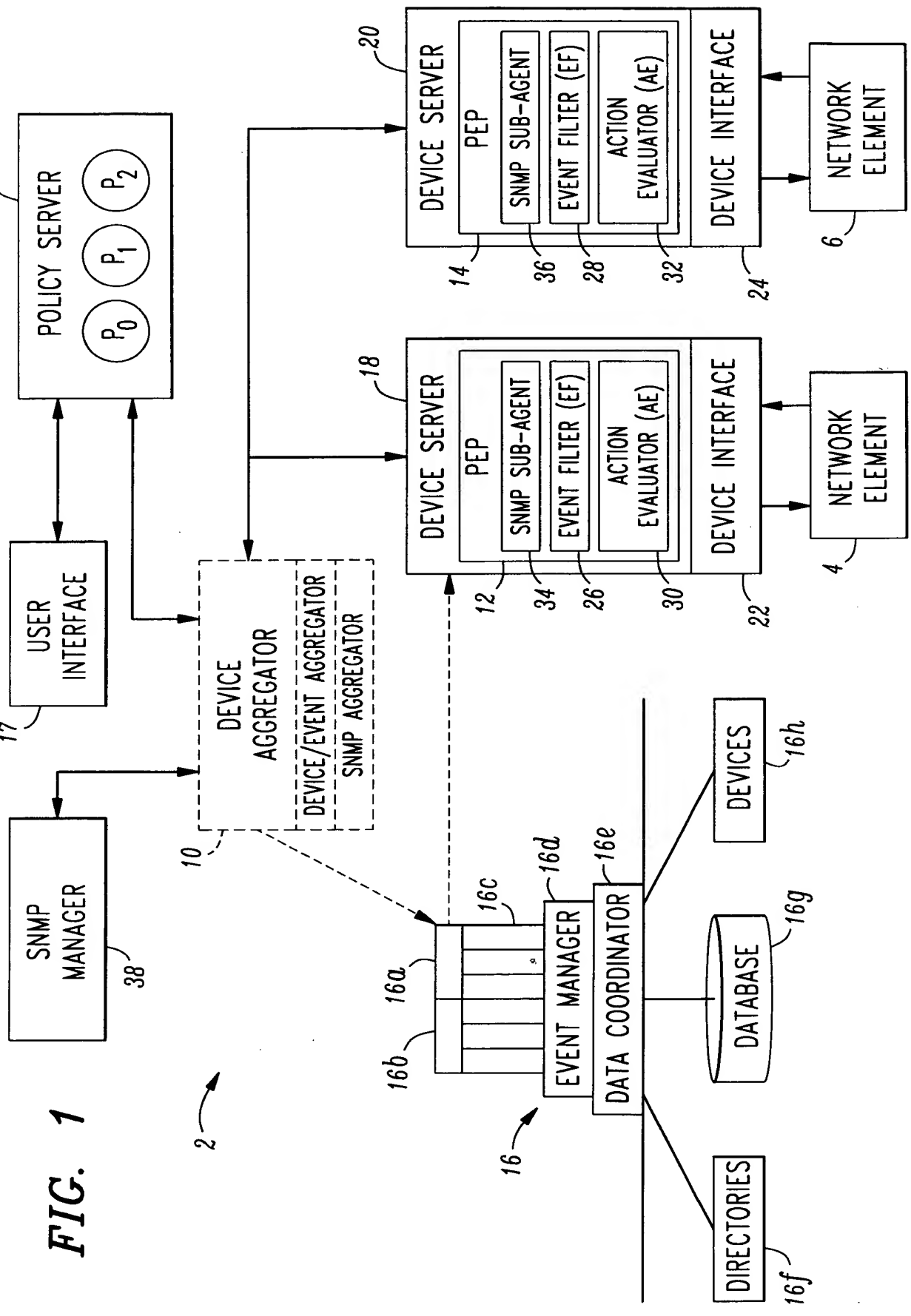

FIG. 1

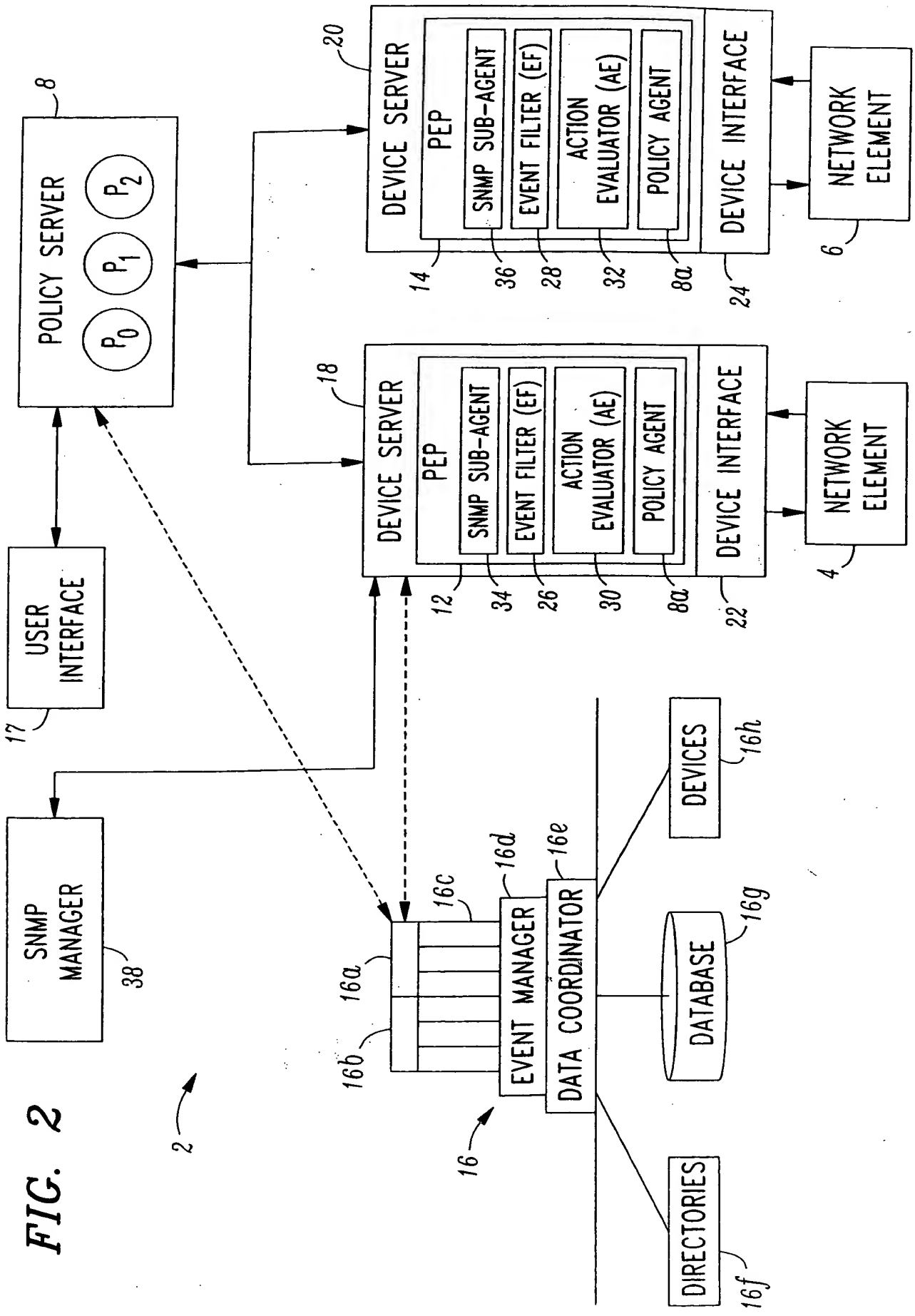
POLICY SERVER
P_0
P_1
P_2
8
USER INTERFACE
17
SNMP MANAGER
38
DEVICE SERVER
PEP
SNMP SUB-AGENT
EVENT FILTER (EF)
ACTION EVALUATOR (AE)
POLICY AGENT
DEVICE INTERFACE
20
14
36
28
32
8a
24
NETWORK ELEMENT
6
DEVICE SERVER
PEP
SNMP SUB-AGENT
EVENT FILTER (EF)
ACTION EVALUATOR (AE)
POLICY AGENT
DEVICE INTERFACE
18
12
34
26
30
8a
22
NETWORK ELEMENT
4
2
16
16a
16b
16c
EVENT MANAGER
16d
DATA COORDINATOR
16e
DEVICES
16h
DATABASE
16g
DIRECTORIES
16f

FIG. 2

FIG. 3

```
public interface ServiceInterface {
/** This method is called by the hosting ServiceNode (which itself has the arg) upon initializing */
void setServiceNode (ServiceNode aServiceNode);
/** Called when a session is opened with this ServiceInterface */
void onOpen (Session aSession);
/** Called when a sendRequest is made to this ServiceInterface */
String onRequest (Session aSession, String aRequest);
/** Called when a sendMessage is made to this ServiceInterface */
void onMessage (Session aSession, String aMessage);
/** Called when a close is made to this ServiceInterface */
void onClose (Session aSession);
/** Called when a Server Session closes abnormally */
void onAbnormalClose (Session aSession);
}
```

FIG. 4

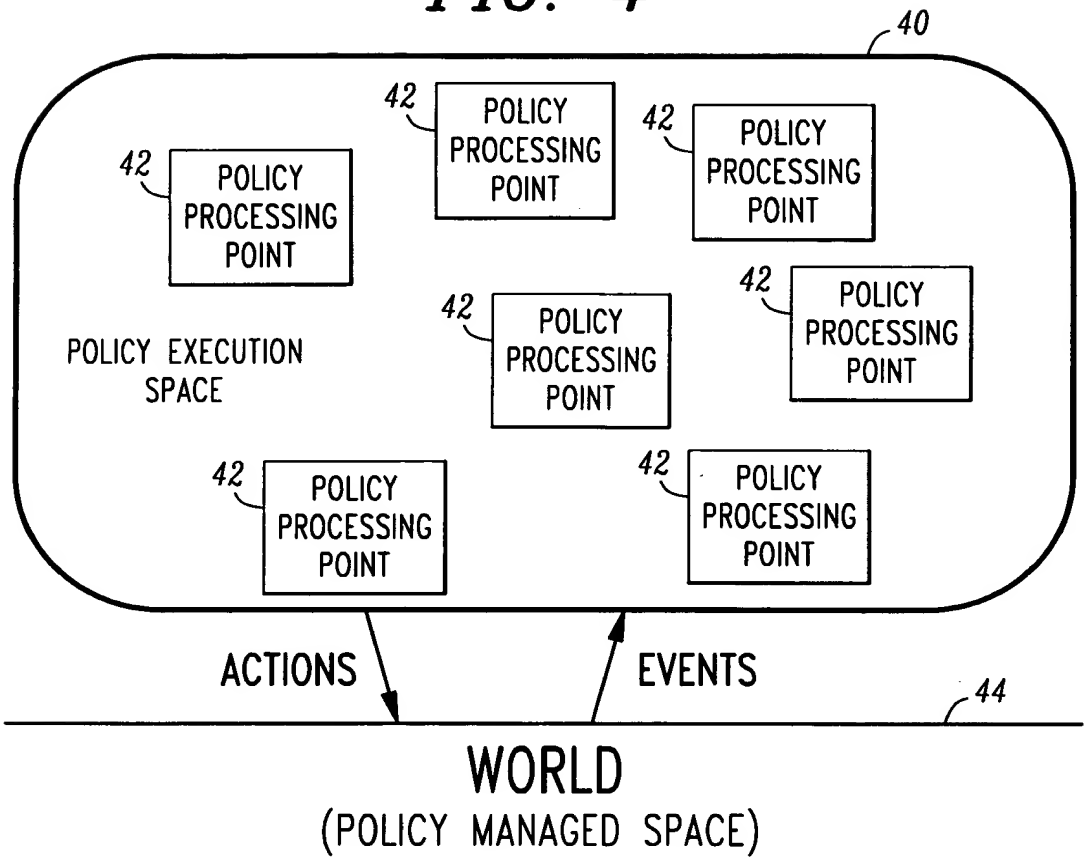
40
42
POLICY PROCESSING POINT
POLICY EXECUTION SPACE
ACTIONS
EVENTS
44
WORLD
(POLICY MANAGED SPACE)

FIG. 5

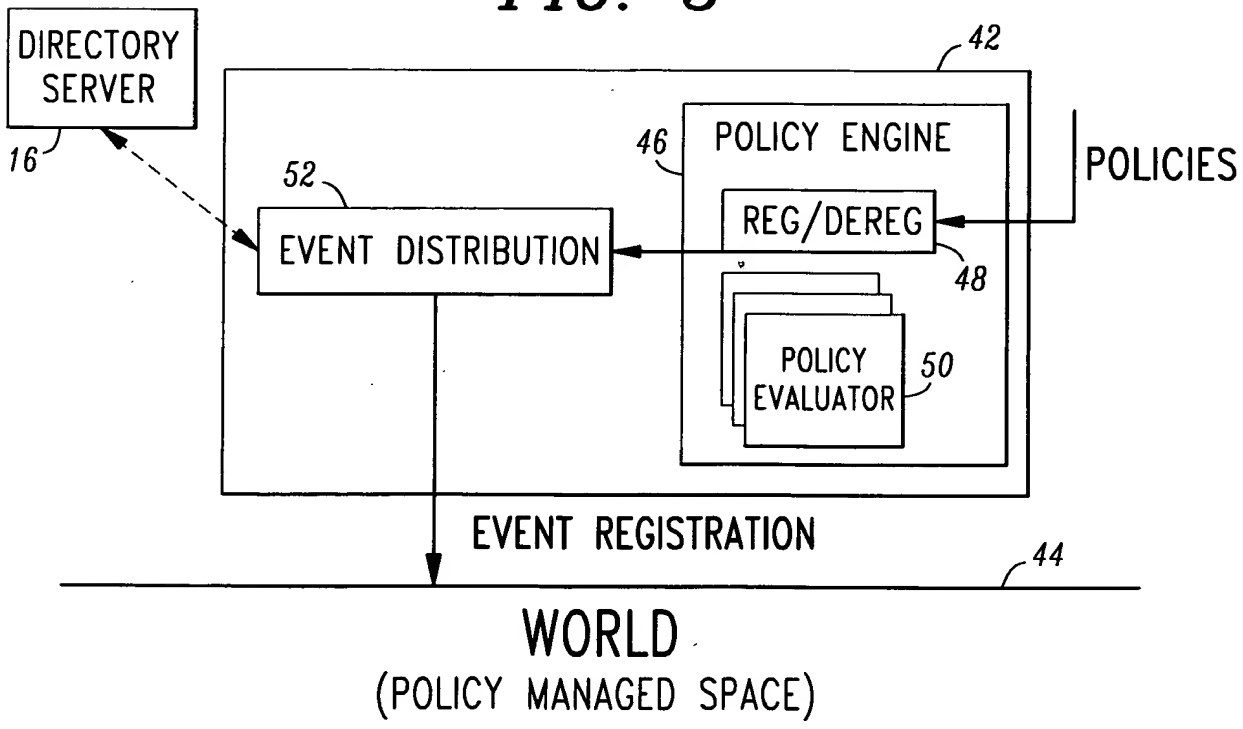
DIRECTORY SERVER
16
42
46
POLICY ENGINE
POLICIES
52
EVENT DISTRIBUTION
REG/DEREG
48
POLICY EVALUATOR
50
EVENT REGISTRATION
44
WORLD
(POLICY MANAGED SPACE)

FIG. 6

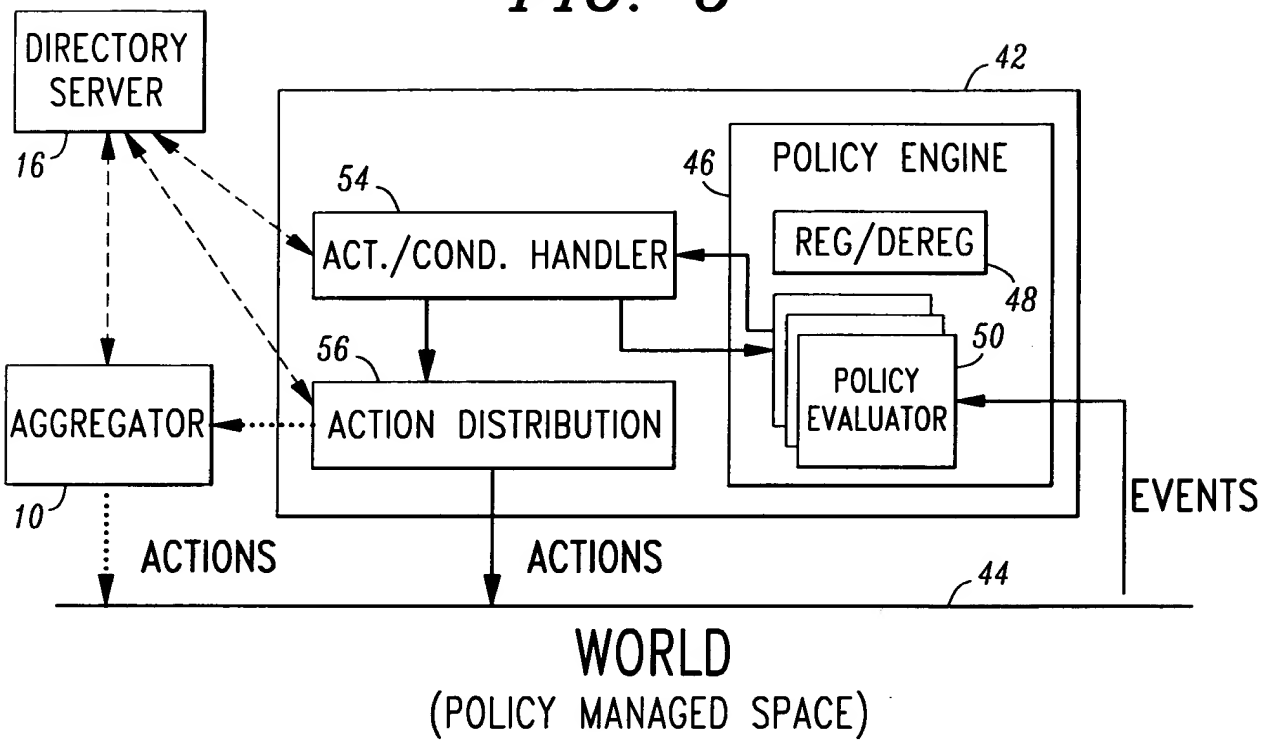
DIRECTORY SERVER
16
42
POLICY ENGINE
46
54
ACT./COND. HANDLER
REG/DEREG
48
50
POLICY EVALUATOR
56
AGGREGATOR
ACTION DISTRIBUTION
10
EVENTS
ACTIONS
ACTIONS
44
WORLD
(POLICY MANAGED SPACE)

FIG. 7

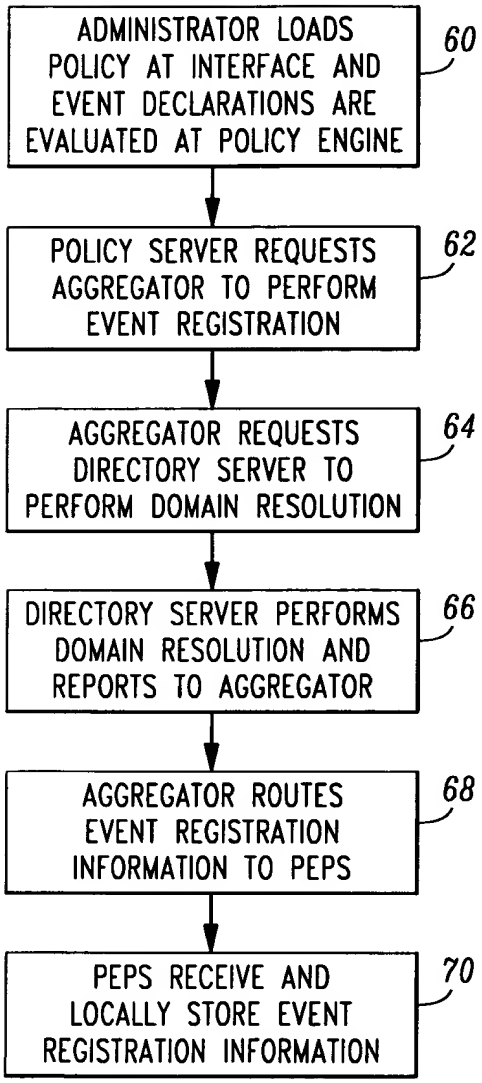
ADMINISTRATOR LOADS POLICY AT INTERFACE AND EVENT DECLARATIONS ARE EVALUATED AT POLICY ENGINE
60
POLICY SERVER REQUESTS AGGREGATOR TO PERFORM EVENT REGISTRATION
62
AGGREGATOR REQUESTS DIRECTORY SERVER TO PERFORM DOMAIN RESOLUTION
64
DIRECTORY SERVER PERFORMS DOMAIN RESOLUTION AND REPORTS TO AGGREGATOR
66
AGGREGATOR ROUTES EVENT REGISTRATION INFORMATION TO PEPS
68
PEPS RECEIVE AND LOCALLY STORE EVENT REGISTRATION INFORMATION
70

FIG. 8

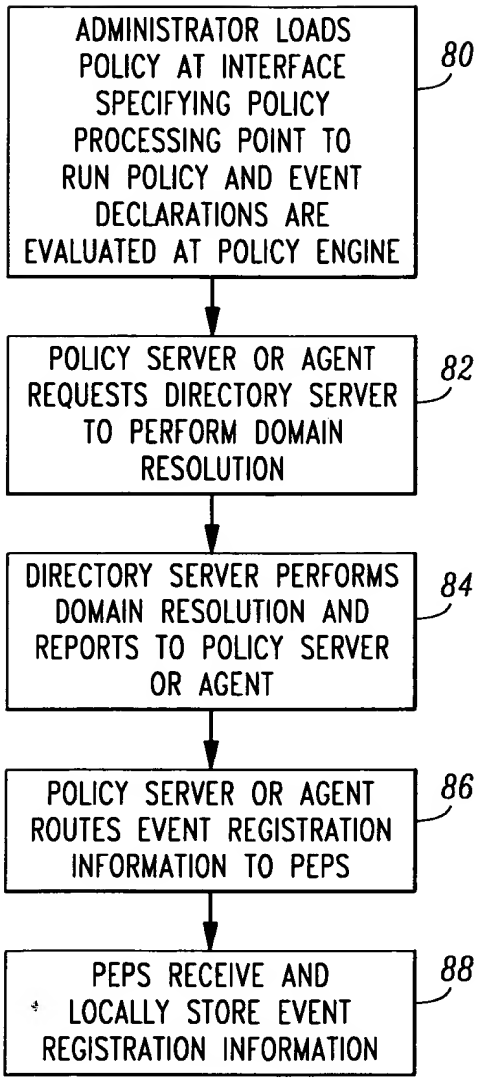
ADMINISTRATOR LOADS POLICY AT INTERFACE SPECIFYING POLICY PROCESSING POINT TO RUN POLICY AND EVENT DECLARATIONS ARE EVALUATED AT POLICY ENGINE
80
POLICY SERVER OR AGENT REQUESTS DIRECTORY SERVER TO PERFORM DOMAIN RESOLUTION
82
DIRECTORY SERVER PERFORMS DOMAIN RESOLUTION AND REPORTS TO POLICY SERVER OR AGENT
84
POLICY SERVER OR AGENT ROUTES EVENT REGISTRATION INFORMATION TO PEPS
86
PEPS RECEIVE AND LOCALLY STORE EVENT REGISTRATION INFORMATION
88

FIG. 9

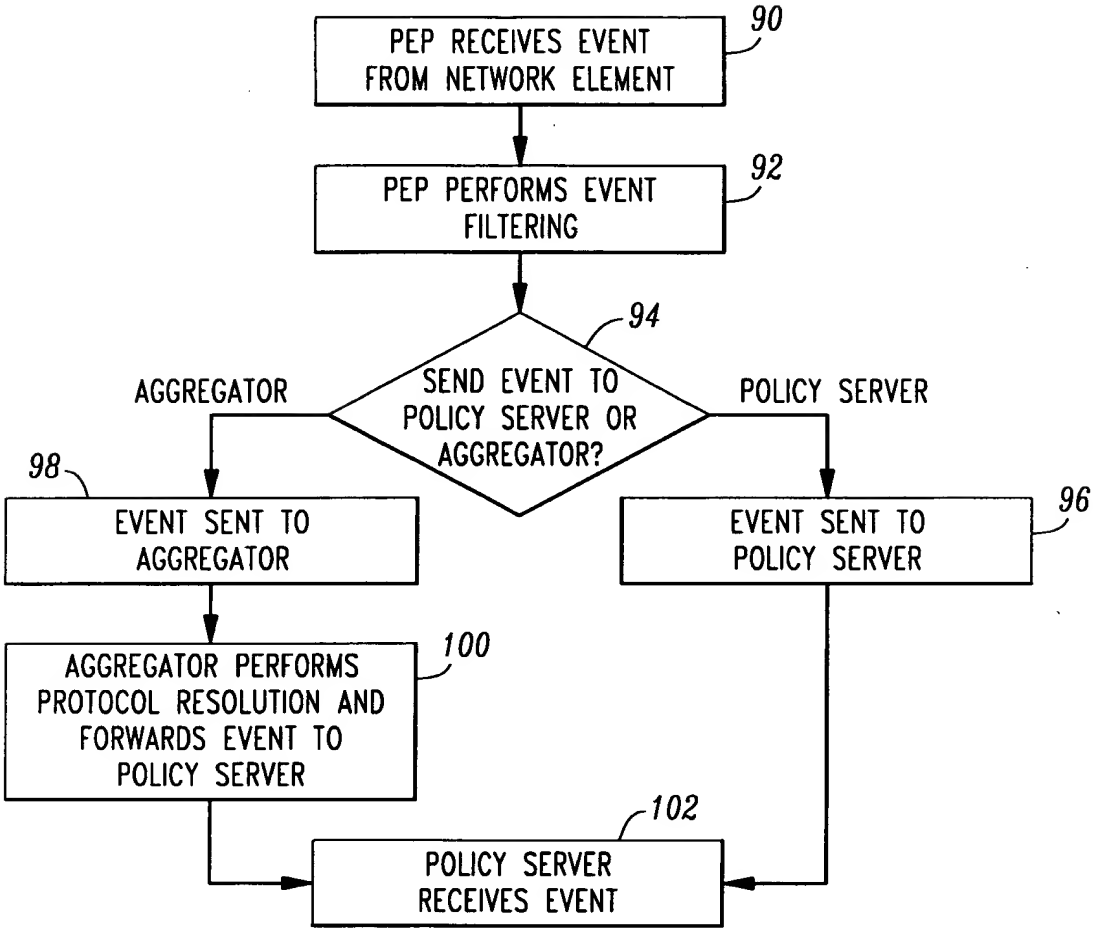
PEP RECEIVES EVENT FROM NETWORK ELEMENT
90
PEP PERFORMS EVENT FILTERING
92
SEND EVENT TO POLICY SERVER OR AGGREGATOR?
94
AGGREGATOR
POLICY SERVER
98
EVENT SENT TO AGGREGATOR
EVENT SENT TO POLICY SERVER
96
AGGREGATOR PERFORMS PROTOCOL RESOLUTION AND FORWARDS EVENT TO POLICY SERVER
100
POLICY SERVER RECEIVES EVENT
102

FIG. 10

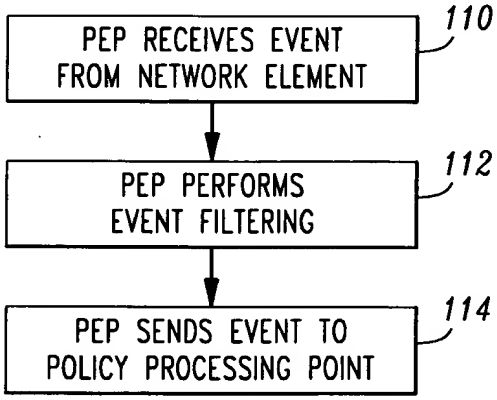
PEP RECEIVES EVENT FROM NETWORK ELEMENT
110
PEP PERFORMS EVENT FILTERING
112
PEP SENDS EVENT TO POLICY PROCESSING POINT
114

FIG. 11

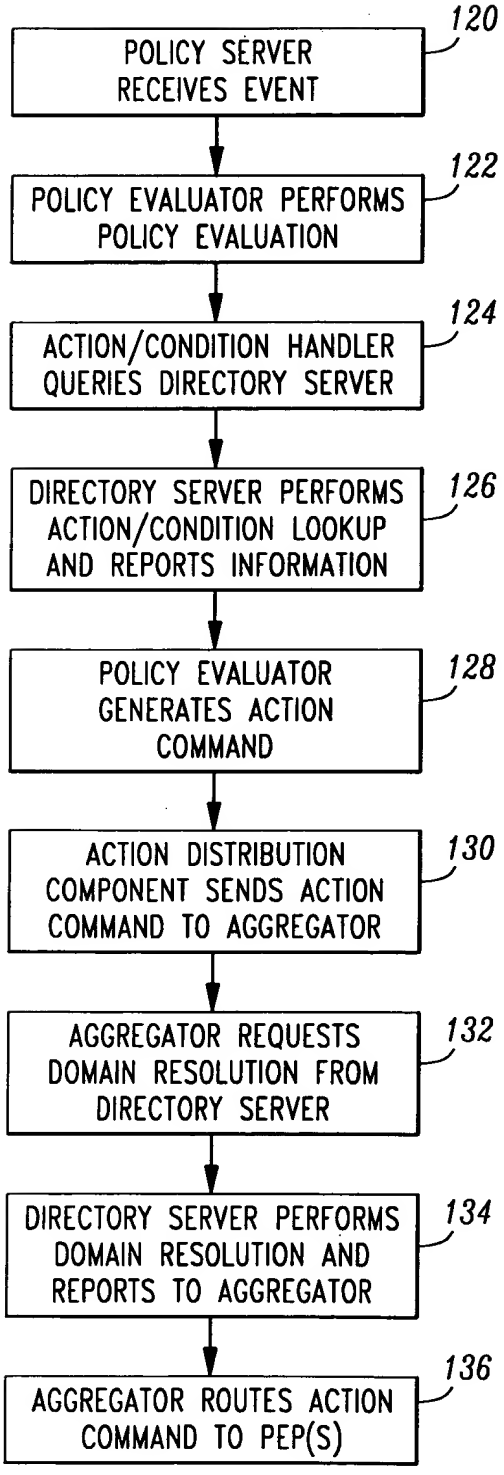
POLICY SERVER RECEIVES EVENT
120
POLICY EVALUATOR PERFORMS POLICY EVALUATION
122
ACTION/CONDITION HANDLER QUERIES DIRECTORY SERVER
124
DIRECTORY SERVER PERFORMS ACTION/CONDITION LOOKUP AND REPORTS INFORMATION
126
POLICY EVALUATOR GENERATES ACTION COMMAND
128
ACTION DISTRIBUTION COMPONENT SENDS ACTION COMMAND TO AGGREGATOR
130
AGGREGATOR REQUESTS DOMAIN RESOLUTION FROM DIRECTORY SERVER
132
DIRECTORY SERVER PERFORMS DOMAIN RESOLUTION AND REPORTS TO AGGREGATOR
134
AGGREGATOR ROUTES ACTION COMMAND TO PEP(S)
136

FIG. 12

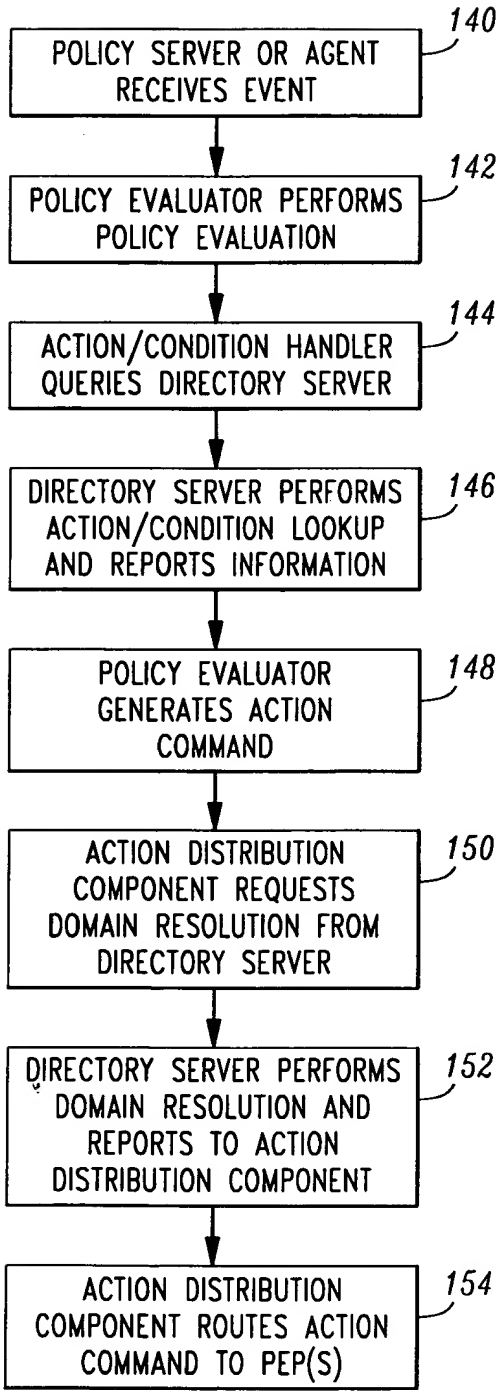
POLICY SERVER OR AGENT RECEIVES EVENT
140
POLICY EVALUATOR PERFORMS POLICY EVALUATION
142
ACTION/CONDITION HANDLER QUERIES DIRECTORY SERVER
144
DIRECTORY SERVER PERFORMS ACTION/CONDITION LOOKUP AND REPORTS INFORMATION
146
POLICY EVALUATOR GENERATES ACTION COMMAND
148
ACTION DISTRIBUTION COMPONENT REQUESTS DOMAIN RESOLUTION FROM DIRECTORY SERVER
150
DIRECTORY SERVER PERFORMS DOMAIN RESOLUTION AND REPORTS TO ACTION DISTRIBUTION COMPONENT
152
ACTION DISTRIBUTION COMPONENT ROUTES ACTION COMMAND TO PEP(S)
154

FIG. 13

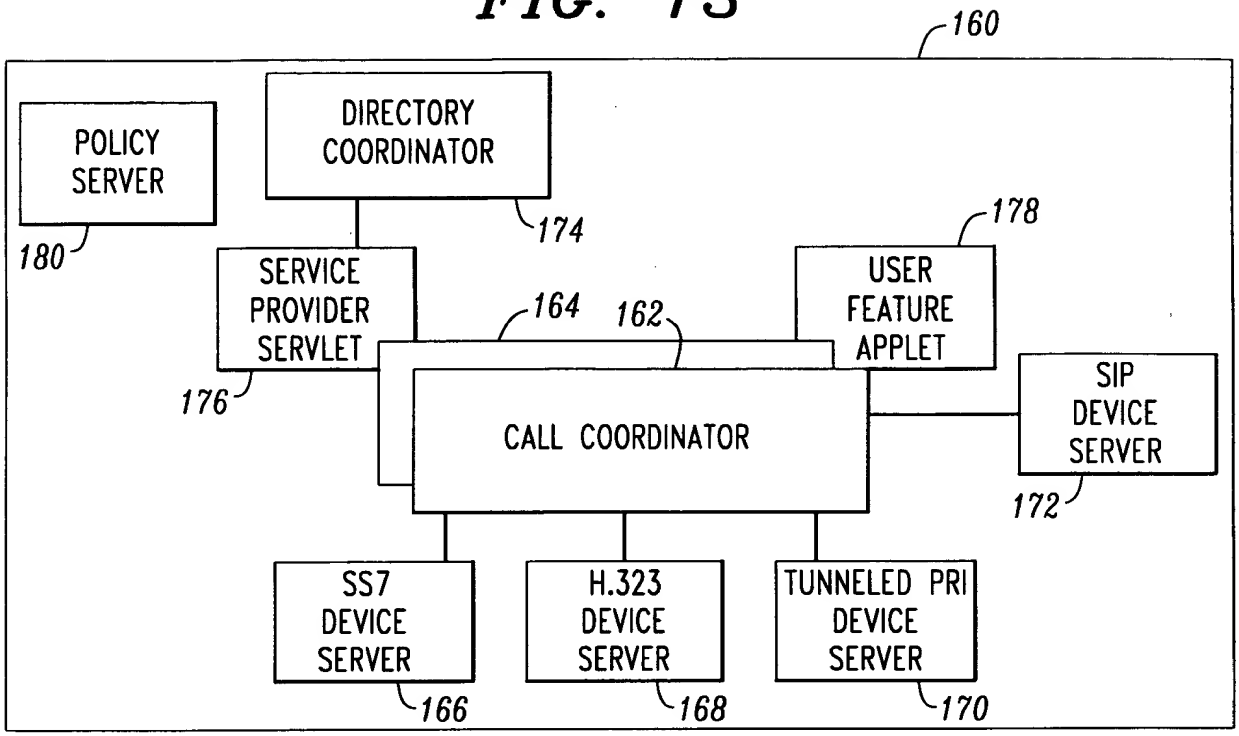
160
POLICY SERVER
180
DIRECTORY COORDINATOR
174
SERVICE PROVIDER SERVLET
176
164
162
USER FEATURE APPLET
178
CALL COORDINATOR
SIP DEVICE SERVER
172
SS7 DEVICE SERVER
166
H.323 DEVICE SERVER
168
TUNNELED PRI DEVICE SERVER
170

FIG. 14

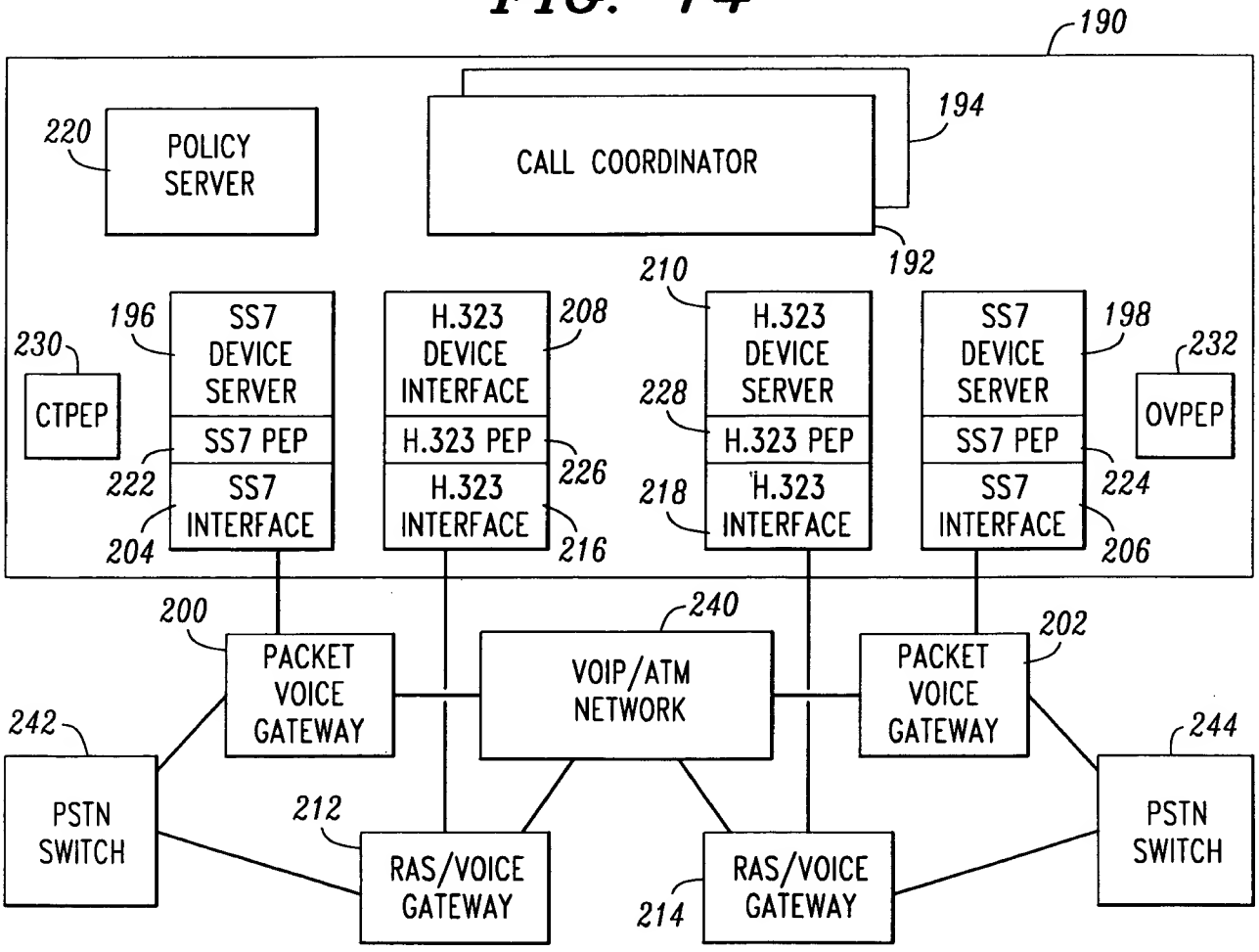
190
220
POLICY SERVER
CALL COORDINATOR
194
192
210
196
SS7 DEVICE SERVER
SS7 PEP
SS7 INTERFACE
204
222
230
CTPEP
H.323 DEVICE INTERFACE
208
H.323 PEP
226
H.323 INTERFACE
216
H.323 DEVICE SERVER
228
H.323 PEP
218
H.323 INTERFACE
SS7 DEVICE SERVER
198
SS7 PEP
224
SS7 INTERFACE
206
232
OVPEP
200
PACKET VOICE GATEWAY
240
VOIP/ATM NETWORK
202
PACKET VOICE GATEWAY
242
PSTN SWITCH
212
RAS/VOICE GATEWAY
214
RAS/VOICE GATEWAY
244
PSTN SWITCH

FIG. 15

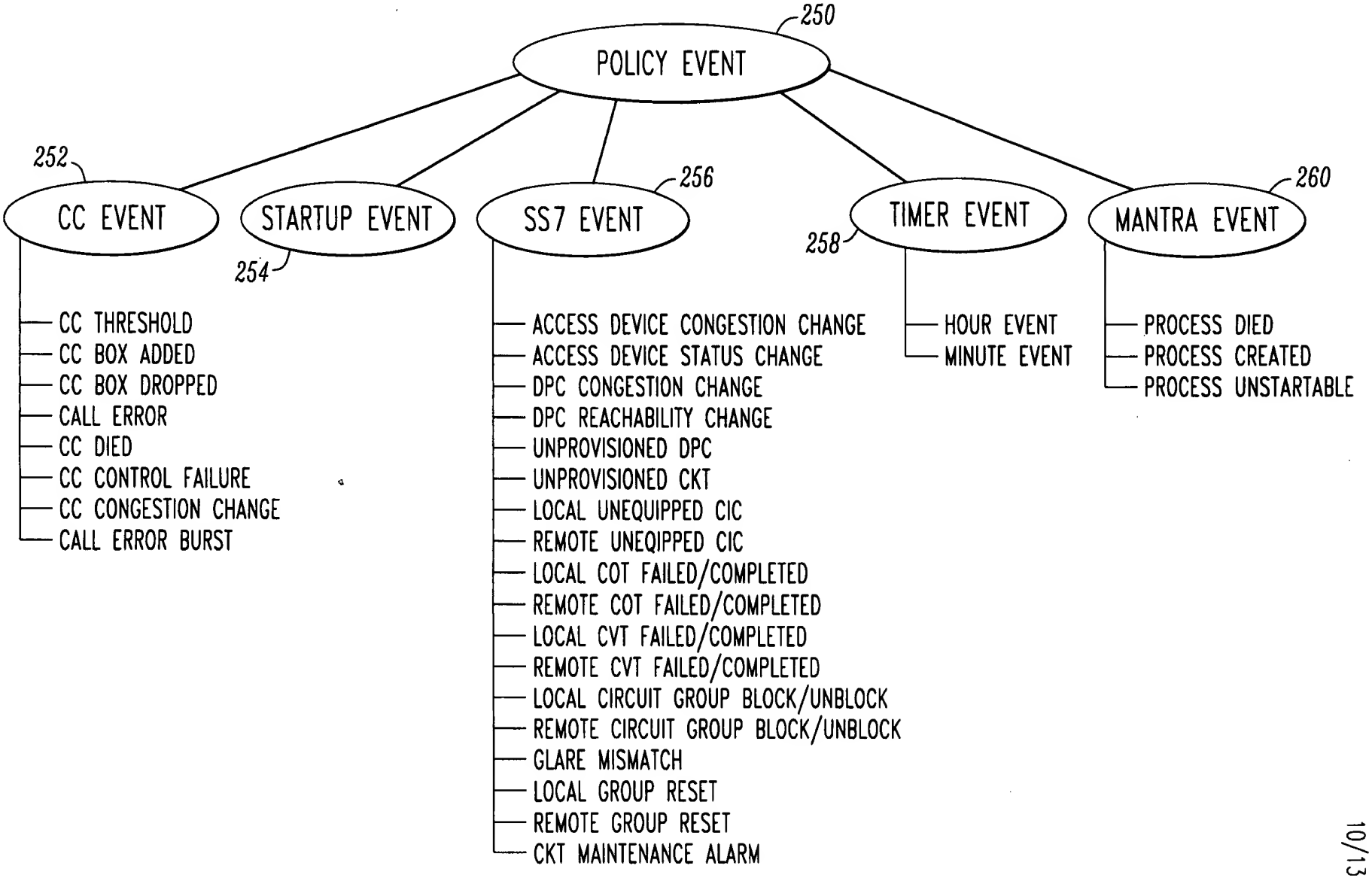

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FIG. 16A

FIG. 16

FIG. 16A	FIG. 16B

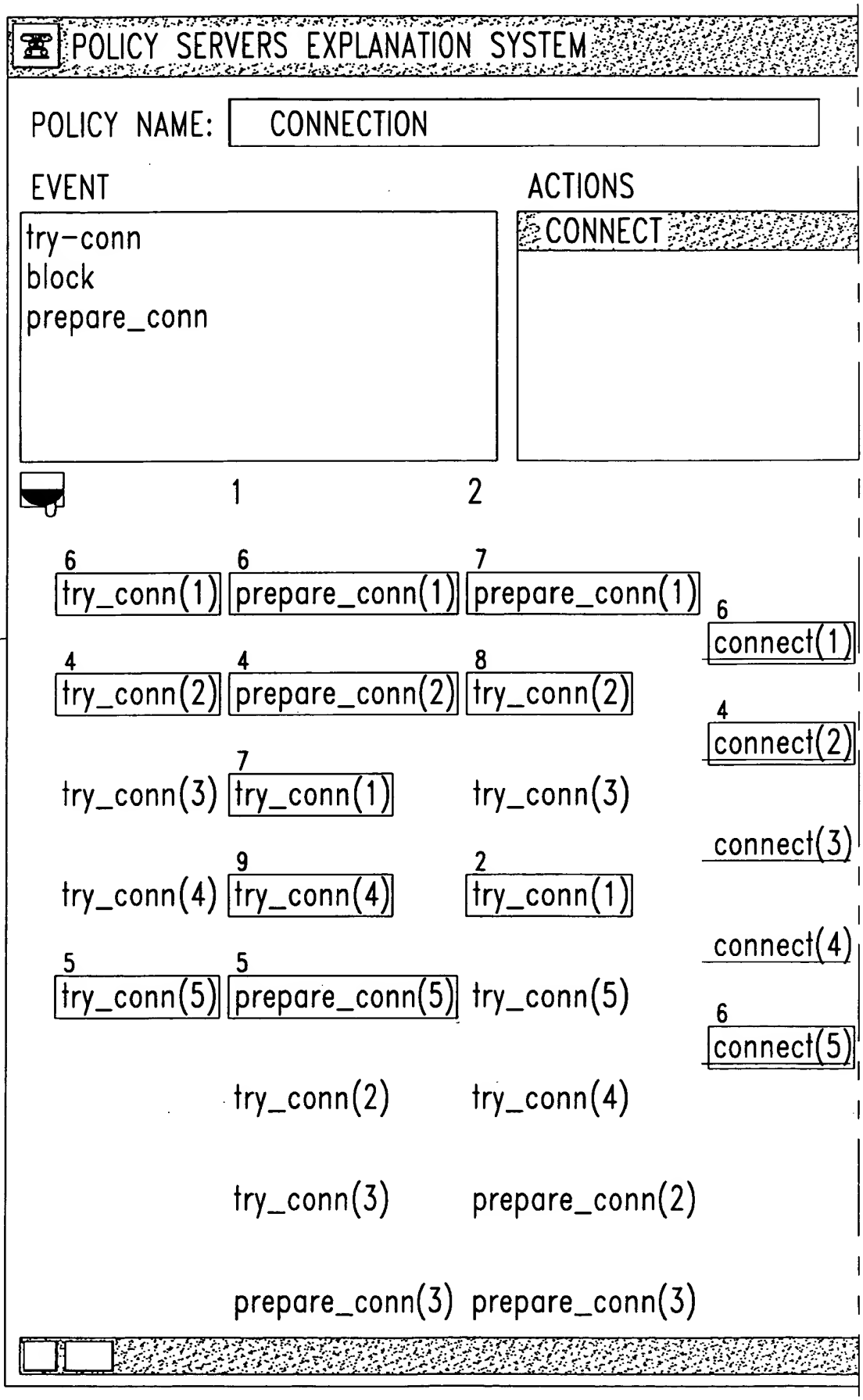


FIG. 16B

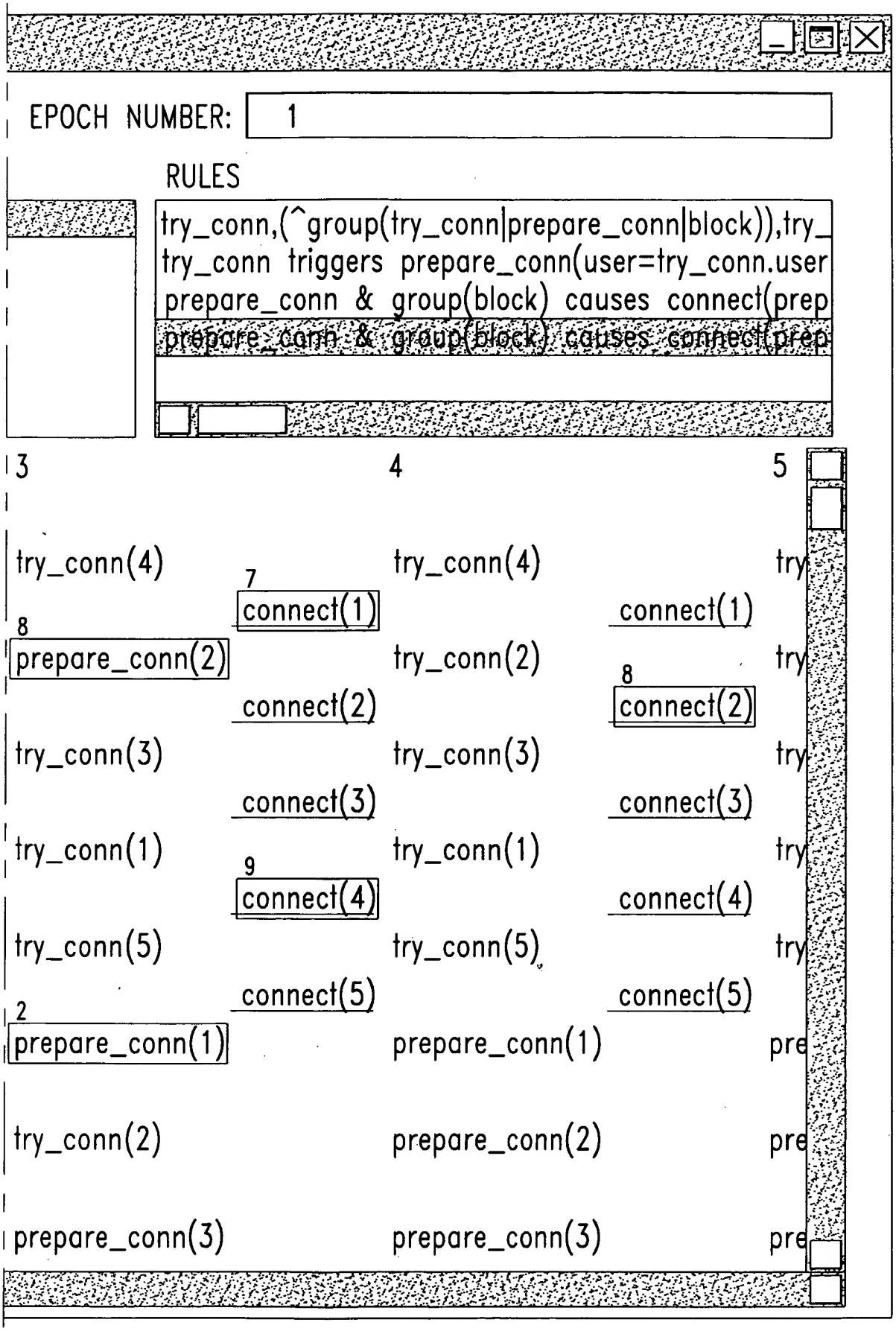
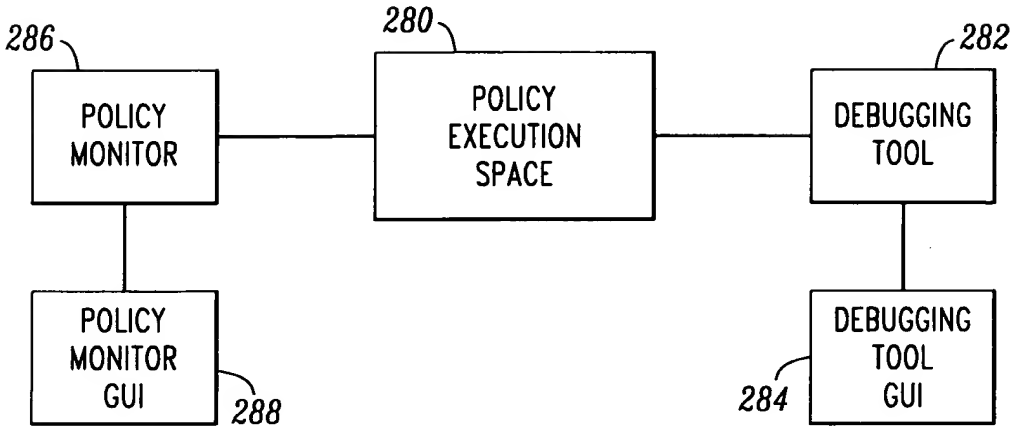

EPOCH NUMBER: 1
RULES
try_conn,(^group(try_conn|prepare_conn|block)),try_
try_conn triggers prepare_conn(user=try_conn.user
prepare_conn & group(block) causes connect(prep
prepare_conn & group(block) causes connect(prep
3
4
5
try_conn(4)
7
connect(1)
8
prepare_conn(2)
connect(2)
try_conn(3)
connect(3)
try_conn(1)
9
connect(4)
try_conn(5)
connect(5)
2
prepare_conn(1)
try_conn(2)
prepare_conn(3)
try_conn(4)
connect(1)
try_conn(2)
8
connect(2)
try_conn(3)
connect(3)
try_conn(1)
connect(4)
try_conn(5)
connect(5)
prepare_conn(1)
prepare_conn(2)
prepare_conn(3)
try
try
try
try
try
pre
pre
pre

FIG. 17


286
280
282
POLICY MONITOR
POLICY EXECUTION SPACE
DEBUGGING TOOL
POLICY MONITOR GUI
288
284
DEBUGGING TOOL GUI